

## AMENDED SPECIFICATION

Reprinted as amended in accordance with the Decision of the Superintending Examiner acting for the Comptroller General dated the twenty eighth day of July 1970, under Section 14, of the Patents Act, 1949.

# PATENT SPECIFICATION

## DRAWINGS ATTACHED

**1,096,451**



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Inventor: HAROLD JOHN DRAPER

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International Classification:—A 47 g 19/22.

## COMPLETE SPECIFICATION

### Drinking Vessels and like Containers

We, MONO CONTAINERS LIMITED, a Company registered under the Laws of Great Britain, of Malt House, Field End Road, Eastcote, Ruislip, Middlesex, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to drinking vessels or like containers, for example disposable drinking cups formed of sheet plastics material.

According to the present invention such a container is formed from sheet material and has a bottom and an integral side wall defining a mouth, and the side wall has corrugations or ribs extending in the direction from bottom to mouth of the container and terminating short of the mouth, and a nesting shoulder on which a similar nesting container can rest to prevent the two containers being wedged together, the circumferential spacing between the corrugations or ribs being small enough for the end of a user's finger to make contact with at least three, and the corrugations or ribs being radially deep enough so that when two similar containers are nested together on the shoulder the corrugations or ribs on the two containers interlock to prevent free relative rotation.

Coveniently the corrugations or ribs terminate at the inner ends at a smooth part of the side wall, and are slightly proud of the said smooth part. The side wall may be generally diverging of frusto-conical shape and if so the portion carrying the corrugations or ribs may diverge at a greater angle from the remainder of the side wall.

In a preferred form of the invention the corrugations or ribs have sides or flanks meeting in an acute angle either at the inside or the outside of the container or both. The sharp angles enable the container to be gripped with only a small area of the side wall in contact with the fingers so that even if the container is holding a hot liquid discomfort may not be caused to the holder.

Additional stiffening may be provided by means of a horizontal ring immediately below the vertical corrugations or ribs or by fillets extending between adjacent configurations or ribs and formed at discrete distances from the bottom of the container.

The invention may be carried into practice in various ways and three embodiments will now be described by way of example with reference to the drawings accompanying the provisional specification of which the two figures (Figures 1 and 2) are respectively elevations of two disposable drinking cups, and with reference to the accompanying drawings whose single figure (identified as Figure 3) is a similar view of another cup.

As shown in Figure 3, a disposable drinking cup formed by a vacuum forming process with plug assist from polystyrene sheet is generally of frusto-conical form with a bottom 11 and an upwardly and outwardly inclined conical side wall 12.

Part of the side wall is reinforced by vertical ribs or corrugations 13 with approximately flat flanks or sides meeting at an acute angle to define fairly sharp ridges at both outside and inside. The circumferential spacing between ridges is slightly less than 0.1 inch and the

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rib depth is about 0.05 inch, and thus the end of a user's finger will make contact with at least three ridges.

These ribs provide some stiffness to the upper part of the cup where it is likely to be gripped by the fingers and also reduce the area of wall in contact with the fingers so that the cup can be grasped without great discomfort even when holding hot coffee.

10 In order to reduce any tendency of the vertically-ribbed section from expanding like a concertina when the cup is filled with a hot liquid the end of the section is stiffened by a horizontal ring 18 formed below the ribs 13, joining the side wall through slight shelves 19.

15 At the bottom the cup is provided with a nesting shoulder 15 whereby a number of cups can be stacked together without getting wedged together. This shoulder comprises a 20 horizontal shelf formed at the top of a ring portion 16 of the side wall whose diameter at the top is less than the diameter of the general line of the cup side wall and is joined to it through the nesting shoulder. The ring 25 is incomplete by virtue of a number of circumferentially spaced vertical stiffeners 17 so that in fact the shelf is in a number of spaced circumferential arcuate portions.

When two cups are nested the bottom corner 30 of the nesting cup rests on the shelf in the lower cup and prevents the two cups becoming wedged together.

The angle of the side wall is less than 10° from the axis of the cup, and the vertical ribs 35 with a depth of about 0.05 inch of the nesting cup interfere with those of the lower cup.

This effectively locates the cups one within another and prevents them from rotating one relatively to the other when they are nested. 40 This is a great advantage because it prevents the cups rubbing together; in the past such rubbing has been found to cause the cups sometimes to be electrostatically charged which may prevent free dropping of cups during automatic vending and which may also cause the cups 45 to collect dust.

It will be appreciated that the vertical ribs can be quite deep radially and yet still this 50 will not interfere with the proper nesting because of the interlocking of ribs between one cup and another.

However, if desired, the upper section of the cup wall having the vertical ribs may be at a slightly greater angle from the axis of 55 the cup than the lower portion of the side wall which is preferably smooth for the printing of advertising matter.

In the embodiment of the invention illustrated in Figure 2 the ribs 13 are nearly 2 inches in length. The horizontal ring 18 is 60 about  $\frac{1}{4}$  inch in height and may have vertical sides or sides inclined the same way as the cup wall 12, or the reverse way.

The embodiment of Figure 1 does not have 65 the ring 18 but the vertical ribs are linked

together at the lower end by horizontal rows of triangular linking pieces or fillets 14 formed in the wall of the cup. The linking pieces 14 are below the outer ridges of the vertical ribs so that the finger of a user does not make contact with them.

#### WHAT WE CLAIM IS:—

1. A drinking vessel or like container formed from sheet material having a bottom and an integral side wall defining a mouth, the side wall having corrugations or ribs extending in the direction from bottom to mouth of the container and terminating short of the mouth, and a nesting shoulder on which a similar nesting container can rest to prevent the two containers being wedged together, the circumferential spacing between corrugations or ribs being small enough for the end of a user's finger to make contact with at least three, and the corrugations or ribs being radially deep enough so that when two similar containers are nested together on the shoulder the corrugations or ribs on the two containers interlock to prevent free relative rotation.

2. A container as claimed in Claim 1 constituting a disposable drinking cup of flexible sheet plastics material.

3. A container as claimed in either of the preceding claims which has been vacuum drawn from sheet thermoplastic material.

4. A container as claimed in any of the preceding claims in which the corrugations or ribs terminate at the lower ends at a smooth part of the side wall, and are slightly proud of the said smooth part.

5. A container as claimed in any of the preceding claims in which the side wall is of diverging frusto-conical shape.

6. A container as claimed in Claim 5 in which the portion of the side wall carrying the ribs or corrugations diverges at a greater angle than the remainder of the side wall.

7. A container as claimed in any of the preceding claims in which the corrugations or ribs have sides or flanks meeting in an acute angle at the inside or the outside of the container or both.

8. A container as claimed in any of the preceding claims including a horizontal ring formed in the side wall immediately below the vertical corrugations or ribs.

9. A container as claimed in any preceding claim including fillets extending between adjacent corrugations and ribs formed at discrete distances from the bottom of the container.

10. A container as claimed in any preceding claim in which the nesting shoulder is provided at the top of a short portion of the side wall which is included upwardly and inwardly from the bottom of the container.

11. A container as claimed in Claim 10 in which the nesting shoulder is in a number of circumferentially spaced portions.

12. A disposable drinking cup constructed

and arranged substantially as herein specifically described with reference to any of Figures 1, 2 and 3 in the provisional and complete specifications.

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PROVISIONAL SPECIFICATION

1 SHEET.

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the Original on a reduced scale

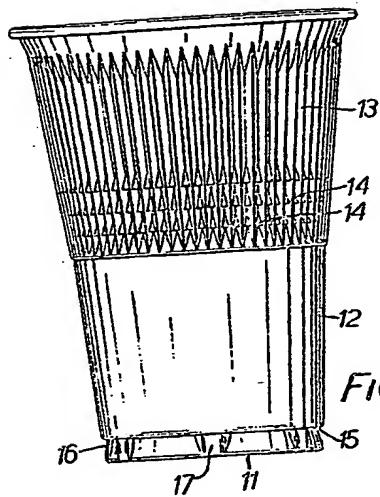


FIG. 1.

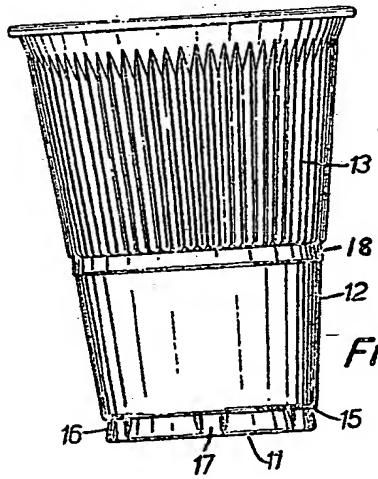


FIG. 2.

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1 SHEET This drawing is a reproduction of  
the Original on a reduced scale

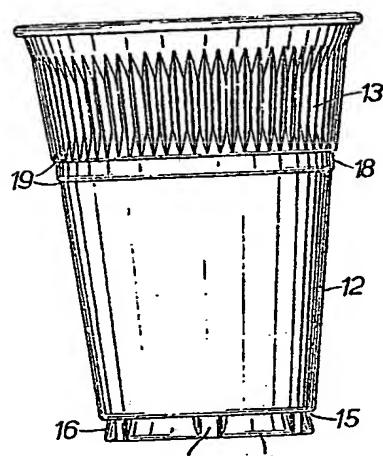


FIG. 3.